**COHEN, DIPPELL AND EVERIST, P.C.**

TABLE IV



PART 90 SERVICES
LOCATED AT SITE PROPOSED
BY FOUR JACKS BROADCASTING, INC.
N 39-17-13 W 76-45-16

| CALLSIGN | RADIO_SRVS | FREQUENCY | LIC_NAME | LAT-DEG | LAT-MIN | LAT-SEC | LON-DEG | LON-MIN | LON_SEC | STREET ADDRESS | CITY | ST | ZIP | ATTENTION | PHONE | PWR-OUT | ERP | GND-ELE | ANT-HGT | HAAT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNKM913 | YS | 937.2750 | HARFORD SMR INC | 39 | 17 | 13 | 76 | 45 | 16 | 814 HOLLY DR E | ANNAPOLIS | MD | 214010000 | | 3019740975 | 150.00000 | 350.00000 | 540 | 550 | 772 | FB2C |
| WNKM913 | YS | 937.2875 | HARFORD SMR INC | 39 | 17 | 13 | 76 | 45 | 16 | 814 HOLLY DR E | ANNAPOLIS | MD | 214010000 | | 3019740975 | 150.00000 | 350.00000 | 540 | 550 | 772 | FB2C |
| WNKM913 | YS | 937.3000 | HARFORD SMR INC | 39 | 17 | 13 | 76 | 45 | 16 | 814 HOLLY DR E | ANNAPOLIS | MD | 214010000 | | 3019740975 | 150.00000 | 350.00000 | 540 | 550 | 772 | FB2C |
| WNKM913 | YS | 937.3125 | HARFORD SMR INC | 39 | 17 | 13 | 76 | 45 | 16 | 814 HOLLY DR E | ANNAPOLIS | MD | 214010000 | | 3019740975 | 150.00000 | 350.00000 | 540 | 550 | 772 | FB2C |
| WNKM913 | YS | 937.3250 | HARFORD SMR INC | 39 | 17 | 13 | 76 | 45 | 16 | | | | | | | | | | | | |

COHEN, DIPPELL AND EVERIST, P.C.

TABLE IV



PART 90 SERVICES
LOCATED AT SITE PROPOSED
BY FOUR JACKS BROADCASTING, INC.
N 39-17-13 W 76-45-16

| CALLSIGN | RADIO_SRVS | FREQUENCY | LIC_NAME | LAT-DEG | LAT-MIN | LAT-SEC | LON-DEG | LON-MIN | LON_SEC | STREET ADDRESS | CITY | ST | ZIP | ATTENTION | PHONE | PWR-OUT | ERP | GND-ELE | ANT-HGT | HAAT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNKM913 | YS | 937.3625 | HARFORD SMR INC | 39 | 17 | 13 | 76 | 45 | 16 | 814 HOLLY DR E | ANNAPOLIS | MD | 214010000 | | 3019740975 | 150.00000 | 350.00000 | 540 | 550 | 772 | FB2C |
| WNKM913 | YS | 937.3750 | HARFORD SMR INC | 39 | 17 | 13 | 76 | 45 | 16 | 814 HOLLY DR E | ANNAPOLIS | MD | 214010000 | | 3019740975 | 150.00000 | 350.00000 | 540 | 550 | 772 | FB2C |
| WNXM924 | IB | 929.1125 | HARTER, R PHILIP:EASTON, A T:EASTON, S D | 39 | 17 | 13 | 76 | 45 | 16 | 1312 ACADEMY CT | BELMONT | CA | 940020000 | R PHILIP HARTER | 4153497800 | 300.00000 | 600.00000 | 540 | 550 | 774 | FB |
| KYC489 | IB | 496.1625 | I & R EQUIPMENT CORPORATION | 39 | 17 | 13 | 76 | 45 | 16 | 5681 MAIN ST | ELKRIDGE | MD | 212270000 | | 3017963200 | 110.00000 | 106.00000 | 540 | 550 | 772 | FB4 |
| KNR529 | IB | 495.9375 | L AND L SUPPLY CORPORATION | 39 | 17 | 13 | 76 | 45 | 16 | 1404 FRONT AVE | LUTHERVILLE | MD | 21093 | | 3018257800 | | | | | | |

COHEN, DIPPELL AND EVERIST, P.C.

TABLE IV



PART 90 SERVICES
LOCATED AT SITE PROPOSED
BY FOUR JACKS BROADCASTING, INC.
N 39-17-13 W 76-45-16

| CALLSIGN | RADIO_SRVS | FREQUENCY | LIC_NAME | LAT-DEG | LAT-MIN | LAT-SEC | LON-DEG | LON-MIN | LON_SEC | STREET ADDRESS | CITY | ST | ZIP | ATTENTION | PHONE | PWR-OUT | ERP | GND-ELE | ANT-HGT | HAAT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WNHW417 | GP | 808.2625 | MARYLAND, STATE OF | 39 | 17 | 13 | 76 | 45 | 16 | POB 8766 | BWI AIRPORT | MD | 212400000 | STATE AVIATION ADMINISTRATION | 3018597022 | 10.00000 | 25.00000 | 540 | 550 | 762 | MO |
| WNHW417 | GP | 853.2625 | MARYLAND, STATE OF | 39 | 17 | 13 | 76 | 45 | 16 | POB 8766 | BWI AIRPORT | MD | 212400000 | STATE AVIATION ADMINISTRATION | 3018597022 | 90.00000 | 232.00000 | 540 | 550 | 762 | FB2 |
| WNKI472 | GO | 853.6125 | MESSENGER EXPRESS INC | 39 | 17 | 13 | 76 | 45 | 16 | 806 15TH ST NW | WASHINGTON | DC | 200050000 | | 2023477333 | 70.00000 | 355.00000 | 540 | 550 | 772 | FB2 |
| WNJY741 | GB | 860.7875 | MILLER, C J | 39 | 17 | 13 | 76 | 45 | 16 | 3514 BASLER RD | HAMPSTEAD | MD | 210740000 | | 3012398006 | 70.00000 | 75.00000 | 540 | 550 | 772 | FB2 |
| WNLX972 | GO | 807.0625 | OVERNITE TRANSPORTATION COMPANY | 39 | 17 | 13 | 76 | 45 | 16 | POB 1216 | RICHMOND | VA | 232090000 | | 3017968550 | 35.00000 | 51.00000 | 540 | 700 | 922 | MO |
| WNLX972 | GO | 852.0625 | OVERNITE TRANSPORTATION COMPANY | 39 | 17 | 13 | 76 | 45 | 16 | POB 1216 | RICHMOND | VA | 232090000 | | 3017968550 | 75.00000 | 55.00000 | 540 | 700 | 922 | FB2 |
| KNA585 | IB | 495.9375 | SMITH REFRIGERATION INC | 39 | 17 | 13 | 76 | 45 | 16 | 6600 HARFORD RD | BALTIMORE | MD | 21214 | | | 75.00000 | 375.00000 | 540 | 550 | 772 | FB2 |

COHEN, DIPPELL AND EVERIST, P.C.

TABLE IV



PART 90 SERVICES
LOCATED AT SITE PROPOSED

*Exhibit B*

VLISSIDES ENTERPRISES, INC.

County of Fairfax
State of Virginia

Matthew J. Vlissides, being duly sworn upon his oath, deposes and states that:

He is a graduate Civil/Structural Engineer, a Registered

VLISSIDES ENTERPRISES, INC.

ENGINEERING STATEMENT

SCRIPPS HOWARD BROADCASTING COMPANY

This engineering statement has been prepared on behalf of Scripps Howard Broadcasting Company ("Scripps"), licensee of inappropriate for the following reasons: All of my assumptions regarding the characteristics of the tower structural system are based on exhaustive study of the structure through personal observations with the use of high power binoculars, high power surveying instruments, large number of photographs taken from short distance with high power lenses, thirty years of experience in dealing with thousands of communications towers' design, analysis, fabrication, installation, inspection and overall construction. In making my assumptions concerning the characteristics of the tower structural system, I was very careful in giving the opposition every possible advantage, i.e.,

a) I assumed that all structural members on the tower (tower legs, horizontals and diagonals) are made of 50,000 psi high-strength steel, which is very questionable. It is more probable that the steel used for the tower legs is 35,000 psi ASTM A53 pipe and for the diagonals and horizontals ASTM A36 solid bars.

b) Examining the tower photographs presented in my tower analysis report, it is obvious that at the top of the tower is the skeleton of a ten bay FM antenna without radiating elements or with very small radiating elements. Because I was not very sure about the type of antenna I totally disregarded this significant antenna load and I did not include it in the tower analysis.

c) The geometry of the tower was carefully measured through surveying instruments and the panel height, type and diameter of the tower leg was verified during these optical measurements.

d) Mr. Hurst on Page 9 of his statement wrongly attests that twenty-three transmission lines were assumed to traverse the tower over the entire distance to each antenna. The truth is that twenty-two transmission lines total were used to feed the various indicated antennas, one conduit for the tower obstruction lights and the tower ladder. All transmission lines did not traverse the tower over the entire distance. Furthermore, in computing the wind load on the transmission lines, I assumed that eight transmission lines, the conduit and the tower ladder have 100% effective projected area to the wind; four transmission lines have 75% effective projected area to the wind; three transmission lines have 50% effective projected area to the wind; six transmission lines have 25% effective projected area to the wind; and the remaining one transmission line has 0% effective projected area to the wind; thus achieving certain transmission line bundling effect even though the actual transmission lines on the tower are <u>not</u> bundled (See Photographs).

e) Mr. Hurst virtually ends his critique by stating that my analysis fails to reflect the fact that lines are bundled into a contention that the tower is safe. However, Mr. Hurst's effort to help the tower situation was destined to fail. Attached is a second revision of the tower analysis where the two 3-1/8 inch rigid transmission lines have been reduced to one 3-1/8 inch line. The balance of the twenty-one transmission lines have been assumed in three bundles under Analysis Case 3 and one single bundle under Analysis Case 4. The tower leg overstress comparison is as follows:

| Leg Section | As It Exists No Bundling (Percent) | Three Bundles (Percent) | One Bundle (Percent) |
|---|---|---|---|
| 1 | 1.7 | * | * |
| 2 | 6.1 | * | * |
| 3 | 5.8 | * | * |
| 4 | 1.7 | * | * |
| 5 | 21.0 | 6.4 | 3.0 |
| 6 | 15.0 | 1.1 | * |
| * | | | |
| 9 | 4.7 | * | * |
| 10 | 19.7 | 13.4 | 10.9 |
| 11 | 7.4 | 2.9 | 1.2 |
| * | | | |
| 14 | 2.3 | * | * |
| 15 | 13.9 | 6.8 | 4.9 |
| * | | | |
| 26 | 6.2 | * | * |
| 27 | 24.1 | * | * |
| 28 | 54.3 | 23.1 | 22.8 |
| 29 | 83.5 | 48.0 | 47.2 |
| 30 | 72.4 | 40.2 | 39.5 |
| 31 | 57.8 | 33.3 | 32.8 |
| 32 | 51.4 | 40.5 | 40.2 |
| 33 | 68.3 | 67.7 | 67.7 |

* Where no stress number is shown or where the numbering of tower sections is not consecutive, it means that there is no overstress in those particular tower sections.

Therefore, Mr. Hurst's plan to use one 3-1/8 inch rigid transmission line and to bundle all small lines in one impractical bundle did not help the tower situation as far as Four Jacks Broadcasting, Inc. is concerned. Still, 30% of the tower

Antenna Design Parameters

| Height | Weight Including Base Support Frame | Shear | Overturning Moment |
| --- | --- | --- | --- |
| 104 ft. | 17,000 lbs. | 8900 lbs. | 393,000 ft-lbs |

k) On Page 6 of the Opposition to Petition to Deny Application the Four Jacks Broadcasting attorney takes a cheap shot against the disclaimer on my Analysis Report. This disclaimer is a standard clause required by the Insurance Company. I stand behind my statements and findings and this waiver of liability is a standard clause and does not detract from my findings.

l) The $350,000.00 engineering estimate for the cost of building a new tower is not an inflated figure; rather, it is a conservative estimate.

m) Based on all the previous statements and the new Structural Computer Tower Analysis (Attached), it is my engineering opinion that, due to the large overstresses calculated in the tower legs, and the large colum buckling evaluation parameter (PHI), even though I gave every possible break to the tower, the subject tower is not adequately designed to support the Channel 2 antenna and its transmission line. Therefore, the subject tower must not be used for the installation of the Channel 2 antenna.

# MATTHEW J. VLISSIDES, P.E.

## ENGINEERING CONSULTANT

Mr. Matthew J. Vlissides, an Engineering Consultant, has over 30 years of experience in structural and mechanical engineering and is a specialist in antenna and tower design, fabrication supervision and installation.

During the past twenty years he has performed extensive successful consulting work in the area of communications for L.T.V. Electrosystems, Inc., Comsat Corporation, Northrop-Page Communications Engineers, Inc., NASA Goddard Space Flight Center, ITT-SPC, COSMOS Engineers, Inc., Stainless, Inc., Bechtel Corporation, MCI, Microflect Company, Inc., R.F. Systems, Inc., Telcom, Inc., DCA, Coast Guard, Plessey, Ltd., Burleson Associates, Inc., E-Systems, Inc., RCA, Fairchild Space & Electronics, Inc., David L. Steel, Sr., P.E., Harris International, RCA Global, RMS, Sanders Associates, T-CAS, TELCOM, Teleconsult, Intelsat, numerous Broadcasting Stations throughout the USA, and others.

Prior to establishing his Engineering Business, Mr. Vlissides was chief structural engineer for Northrop-PAGE where he was responsible for the analysis, design, specification writing and fabrication supervision of advanced structures, such as self-supporting and guyed communication towers, antennas, tracking stations, radio telescopes and structures for the space communications program. He was instrumental in the development of the 42' antenna transportable commercial station operated by Comsat, and in the design of the wheel and track antenna and the integrated two-story building with antenna on top, utilized by LTV Aircraft Company.

Mr. Vlissides has participated in the successful engineering and implementation of several multimillion dollar projects, including the structural design and implementation of earth stations in Panama, Iran, Lebanon, Brazil, and the Comsat stations at Brewster, Andover and Paumalu. He was responsible for the structural/mechancial design of earth stations in Australia, Thailand and the Philippines, as well as West Coast tracking stations for the U.S. Navy.

In the intricate area of shock and vibration isolation and electronics equipment packaging in shelters, Mr. Vlissides has solved difficult problems for Page Communications Engineers at OGDEN Laboratories involving the MRC-113 U.S. Air Force Program.

Mr. Vlissides participated in the analysis, design and implementation of large microwave and troposcatter communications programs, including the multimillion dollar IWCS in

Vietnam, the Iranian Microwave (INTS), the NATO Bypass, and the Hongkong-Taiwan-Philippines tropo system. The major areas of involvement covered feasibility studies, advance survey details, civil-mechanical and electrical designs, and final implementation.

Mr. Vlissides was heavily involved in the design and construction of the VOA antenna and tower systems in VOA Kavala, Greece; Rhodes, Greece; and Liberia, Africa.

He has extensive experience in the design of structures using non-conventional materials as plastics, non-metallic filaments, glass filaments, etc.

In the area of multi-leveled guyed towers, Mr. Vlissides expanded a computer program able to handle guyed towers of up to 20 guy levels, and carrying concentrated loads and a top electronic umbrella with up to 36' long radials. The tower is treated as a beam-column on elastic supports with all secondary effects taken into consideration. Recently, Mr. Vlissides has developed a computerized design of a family of self-supporting and guyed microwave towers, covering a range of heights from 20-foot stub antenna mounts to 500-foot applicable and very economical for large communication projects.

Mr. Vlissides, In addition, has extensive experience in building structural analysis and design, such as highrise office and apartment buildings, hospitals, churches, communications buildings, etc.

Earlier, Mr. Vlissides was employed as a Structural Engineer by the U.S. Navy Department, Bureau of Yards and Docks, where he was responsible for the development of BUDOCKS criteria and standards and the design of structures for antennas and other communication facilities, and was heavily involved in the Nord Antenna and West Pac Australia Antenna Projects. In a previous position with the District of Columbia Highway Department, Bridge Division, he was field engineer for the D.C. approaches of the Theodore Roosevelt Bridge. Prior to this, he was involved in the engineering, administration, design and construction supervision of Public Works for the Greek Government.

Mr. Vlissides' professional affiliations include:

Association of Federal Communications Consulting Engineers

American Society of Civil Engineers, Fellow
National Society of Professional Engineers
American Concrete Institute
Professional Engineer - District of Columbia - #5949
Professional Engineer - New York - #044849
Professional Engineer - Maine - #2639
Professional Engineer - Maryland - #7868

Professional Engineer - Virginia - #05782
Professional Engineer - Pennsylvania - #20621.E
Professional Engineer - Illinois - #62-32261
Professional Engineer - New Jersey - #12618
Professional Engineer - Kentucky - #11506
Professional Engineer - Alabama - #15408
Professional Engineer - Arizona - #19057
Professional Engineer - Arkansas - #6273
Professional Engineer - Colorado - #23862
Professional Engineer - Connecticut - #14015
Professional Engineer - Delaware - #6957
Professional Engineer - Florida - #0036341
Professional Engineer - Georgia - #15453
Professional Engineer - Idaho - #5272
Professional Engineer - Indiana - #ENE8600628
Professional Engineer - Iowa - #10765 (Retired)
Professional Engineer - Kansas - #10337
Professional Engineer - Massachusetts - #32444
Professional Engineer - Michigan - #31880
Professional Engineer - Minnesota - #17485
Professional Engineer - Mississippi - #9591
Professional Engineer - Missouri - #E-21442
Professional Engineer - Nebraska - #E-6055
Professional Engineer - Nevada - #7162
Professional Engineer - New Hampshire - #6347
Professional Engineer - Wyoming - #5096
Professional Engineer - Ohio - #E-49967
Professional Engineer - Oregon - #13,133
Professional Engineer - Rhode Island - #4832
Professional Engineer - South Carolina - #10437
Professional Engineer - Utah - #7425
Professional Engineer - Vermont - #5193
Professional Engineer - Wisconsin - #E-24060
Professional Engineer - New Mexico - #9598
Professional Engineer - Louisiana - #22119
Professional Engineer - North Carolina - #12902
Professional Engineer - South Dakota - #4222
Professional Engineer - Montana - #ENG08785
Professional Engineer - North Dakota - #PE-3023
Professional Engineer - Washington - #23117
Professional Engineer - Oklahoma - #14540
Professional Engineer - West Virginia - #9901
Professional Engineer - Tennessee - #17,990
Professional Engineer - California - #C 040249
Professional Engineer - Texas - #59573

Certificate of Qualification by the National Engineering Examiners, No. 4003.

Tau Beta Pi Honorary Engineering Society
Certified Fallout Analyst and Protective Construction Analyst, DOD - 2TT0318865

Electronics Industries, Association, TR-34.2 Subcommittee on Earth Station Antennas. TR 14.7 Tower Committee on Communication Towers

Mr. Vlissides' major recent studies and prototype designs include:

Large Tracking Antenna Tower & Foundation Analysis & Design Consideration (July 1968)

Large Tracking Antenna Building & Foundation Earthquake Analysis & Design Considerations (July 1968)

Application of Fiberglass/Plastic to transportable communications systems.

High-gain Antennas Surface Geometry Determination (January 1968)

Optimum Antenna Design for Synchronous Communications Satellites (January 1970)

Original Design of 32-foot Transportable or Fixed Tracking Antennas (April 1971)

Participation in the preparation of Earth Station Antenna Standards for the Electronics Industries Association (EIA) (1969-1971)

Effective low cost methods for equipment shock and vibration isolation (June 1971)

Design of an experimental multibeam antenna system of satellite communications (1971-1972) Comsat Corporation

Analysis, Design & Fabrication Supervision of the Sectionalized Loran-C Transmitting Antenna for Cosmos Engineers, Inc. and the U.S. Coast Guard (1972-1973)

Tall guyed towers with provision of a broken guy condition and secure and easy access to the tower elevator landing directly from the transmitter building. Various applications at WBNS-TV, WJXT-TV, WBTV, WCBD, WXFL-TV and Hill Tower, Inc.

Mr. Vlissides has a B.S. Degree from the Athens, Greece Military Academy; B.C.E. and M.C.E. in Structural Mechanics from the Catholic University of America, where he has been a Doctoral Candidate in Structural Mechanics and Dynamics.

His language capabilities include English and Greek.

***Exhibit C***

# COMPUTER STRUCTURAL ANALYSIS
# & ENGINEERING EVALUATION
# OF THE
# 666 FT. GUYED TOWER
# CATONSVILLE, MARYLAND
2ND REVISION
FEBRUARY 1992

FOR
SCRIPPS HOWARD BROADCASTING COMPANY

BY
VLISSIDES ENTERPRISES, INC.
7601 BURFORD DRIVE
McLEAN, VIRGINIA 22102
(703) 356-9504

## TABLE OF CONTENTS

# SECTION A

**INTRODUCTION**

The subject structure is a 666 ft. guyed tower located in Catonsville, Maryland (Coordinates: 39° 17′ 13"; 76° 45′ 16"). The tower has a triangular cross-section with a face width of 4 ft. It is supported on a hinged base with seven guy levels of three guys each. The tower was designed and manufactured by Utility Tower Company in 1969.

The purpose of this analysis is to investigate the structural capability of the tower to support the Channel 2 TV antenna on top and its one 3-1/8" transmission line, in addition to the existing antennas and transmission lines.

The following assumptions have been made regarding the major characteristics of the structural system employed in the design of the subject tower:

a) Section panels were assumed to be approximately 5 ft. in height.

b) The tower span lengths were estimated to be 93.5 ft., 95.2 ft., 95.2 ft., 95.2 ft., 94.5 ft., 95.2 ft. and 94.4 ft. for Spans #1 through #7 respectively.

c) The inner and outer guy anchors were estimated to be at 262 ft. and 402 ft. distances from the tower respectively.

d) The guy cables are E.H.S. cables with estimated diameters of 5/8", 5/8", 3/4", 5/8", 3/4", 7/8" and 1" for guy levels #1 through #7 respectively.

e) The tower legs were assumed to be of 3.5" O.D. with 0.300" wall thickness in the bottom 500 ft. of the tower and 0.216" wall thickness from 500 ft. to top.

f) All the diagonal members were assumed to be solid rods of 5/8" diameter.

g) All the horizontal girts were assumed to be solid rods of 1" diameter.

h) All the tower members were assumed made of 50,000 psi minimum yield strength steel.

i) The tower sections are of all welded construction and are bolted together through round splice plates on each leg.

j) The tower color banding is in accordance with the FAA Advisory Circular 70/7460-1H for towers under 700 ft. height.

The overall structural system of the tower resists the guy reactions, the wind loads and bending moments by having the legs in tension or compression; the diagonals in tension; and the girts in compression. The structural integrity of the tower depends mainly on the buckling load capacity of the legs and girts and the tension load capacity of the diagonals and guy cables.

The subject tower was analyzed under a 75 mph basic wind velocity (no ice) in accordance with the EIA/TIA Standard 222-E. The computed wind pressure was applied to all tower members, antennas and ancillary items (transmission lines, ladder, conduits, etc.). No ice loading was considered in this analysis.

PHOTOGRAPHS